

Measuring reactions of key intermediates in hydrocarbon oxidation

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The oxidation of hydrocarbons in combustion or other systems involves a complicated web of chemical transformations, passing through multiple unstable intermediates. Modeling the oxidation process requires understanding how these intermediates react. However it is unsettlingly common that critical intermediate species cannot be readily interrogated, and that the kinetics of key reactions must be inferred from indirect measurements. I will discuss recent combinations of experiment and theory that indirectly reach inside the “black box” of oxidation processes to probe the underlying mechanisms of important reactions, with particular emphasis on understanding the fundamental chemistry relevant to autoignition of traditional, non-traditional, and alternative fuels. Moreover I will highlight recent progress towards *direct* measurement of the kinetics of some elusive intermediates in combustion and tropospheric chemistry.

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